

# THE FISHES OF MUDUMALAI WILDLIFE SANCTUARY, TAMIL NADU, SOUTH INDIA<sup>1</sup>

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(With one text-figure)

**Key words:** Western Ghats, Nilgiri Biosphere Reserve (NBR), Tamil Nadu, Mudumalai, hillstream fishes.

The paper describes 38 species of fishes belonging to 21 genera, 12 families and 8 orders from Mudumalai Wildlife Sanctuary, Tamil Nadu. Common names, vernacular names, notes on morphological characters — range of distribution, status and relative abundance have been discussed.

## INTRODUCTION

Tamil Nadu with its 14 Wildlife Sanctuaries and 5 National Parks has a vast network of protected areas covering c. 2834 sq. km, i.e. 12.48% of the total forest area (Venkataraman 1995). Mudumalai Wildlife Sanctuary (MWS) forms 11.32% of the total protected area in the state. Increasingly, decisions affecting park resources are made with limited biological information especially for little known groups such as fishes. Forest managers need accurate assessments of the occurrence of species or genotypes, and the status of their populations. These assessments are essential to form natural resource management policies, to manage the natural diversity and to identify potential areas of high conservation value.

This paper describes the fishes of Mudumalai Wildlife Sanctuary, with a note on their distribution and morphological characters. As in earlier studies (Hora 1941, Hora and Law

1941, Hora 1942, Rajan 1955, 1963; Silas 1951a, b; Rema Devi and Indra 1986) peninsular India, especially the hill ranges lying in the Nilgiris, has proved to be an ideal site for ichthyological studies, as physiography has contributed to the presence of diverse fish fauna.

## STUDY AREA

Mudumalai Wildlife Sanctuary is situated in Nilgiri dist., Tamil Nadu (11° 30' to 11° 39' N Lat., 76° 27' to 76° 43' E Long.), an area of 321 sq. km, which includes 103 sq. km of National Park (Fig. 1). The sanctuary is bounded by Bandipur Tiger Reserve (Karnataka) on the north, by Wynaad Sanctuary (Kerala) on the northwest, by vast stretches of Sigur reserve forest (Tamil Nadu) towards the east and by private coffee and tea estates to the south. The altitude ranges between 1258 m (Morganbettea) and 625 m (Moyar Reserve Forest). The terrain is gently undulating in the western portion, while the eastern portion is almost flat. Annual rainfall ranges from 800 to 1800 mm. The forest types vary from open thorny scrub to hilltop evergreen forest. Dry as well as moist deciduous forests form a large portion of the sanctuary. Teak plantations are also common. MWS has four major administrative ranges: 1. Kargudi range (54.6 sq. km), 2. Theppakadu range (89.5 sq. km),

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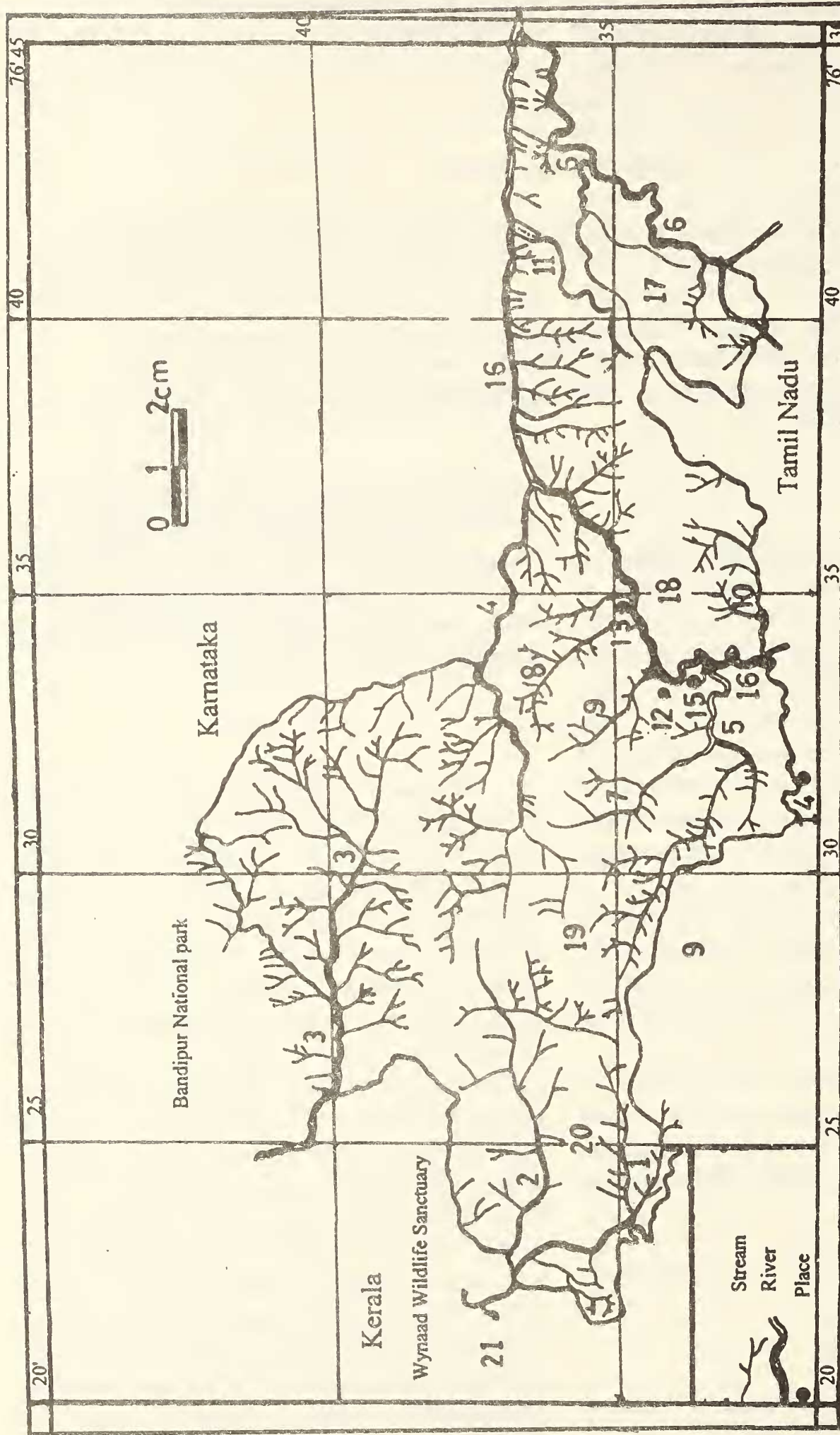
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1. Mukkatti hole, 2. Benne hole, 3. Mavin halla, 4. Kakkan halla 5. Bidar halla, 6. Sigur pallam, 7. Ombatta tod, 8. Kal halla, 9. Hoshi halla, 10. Sigur river, 11. Moyar Canal (Moyar power house), 12. Kargudi, 13. Teppakadu, 14. Vallattottam, 15. Abhayaranyam, 16. Thorapalli, 17. Avarahalla RF, 18. Moyar Reserved Forest, 19. Kubarakolli RF, 20. Benne Reserved Forest, 21. Nulpuzha.

Fig. 1: Streams and Rivers of Mudumalai Wildlife Sanctuary

Mudumalai range (96.6 sq. km) and Masinagudi range (80.4 sq. km).

**Streams and river:** Mudumalai is a remarkably well watered sanctuary (Davidar 1985). Besides the Moyar and Sigur rivers, their tributaries called *halla*, meaning water course, run deep into the sanctuary. The flume channel taking water from the Sinkara powerhouse to the Moyar powerhouse lower down, with its regulatory dam at Maravankandy and its seepage, form yet another water complex. Moyar and its tributaries, along with the perennial river and streams via Sigur river, Bidar halla, Kakan halla, Mavan halla, Mavin halla, Imbar halla, Mukkatti hole and Avara halla are the major water sources of the sanctuary and they provide suitable habitats for fishes in the sanctuary.

Mukkatti hole originates from Mukkitti reserve forest and joins Nul Puzha in Nul reserve forest of Kerala. Benne hole starts near Kapur and runs out to the sanctuary and joins Mukkatti hole near Kaniyaram, outside the Sanctuary area and finally joins Nul Puzha in Kerala. Mavin halla forms the boundary between Kerala and Tamil Nadu on the northwestern side. Kakkanhalla forms a boundary between Karnataka and Tamil Nadu. Kakkan halla is fed by its tributary Imbar halla. Bidar halla joins Moyar 2 km from Abhayaranyam. Its tributary, Ombatta Todu, forms the Ombatta swamp before it joins Bidar halla.

Sigur river, with its tributaries Mavan halla and Avara halla, enters MWS near Vallatottam at the southeastern part of the sanctuary. River Sigur joins Moyar at Pathattipatti. It forms the sanctuary boundary on the southeast.

Moyar river supported by 5 tributaries is the only major river in the sanctuary. It enters MWS near Thorapalli at the middle of the southern end and runs through Abhayaranyam, Kargudi, Teppakadu (where it forms MGR fall) and then runs along the boundary between Karnataka and Tamil Nadu. While Karimara hole joins Moyar just outside the southern

boundary of the sanctuary, Bidar halla (near Abhayaranyam), Hoshi halla (near Kargudi) and Kal halla (near Theppakadu) feed the river inside the sanctuary. Kakkan halla, that forms the northern boundary of the sanctuary, joins Moyar after MGR fall.

**Methodology:** Sampling was carried out seasonally during 1995-96 using cast nets, gill nets, scoop nets and drag nets. To minimise the collection from the wild, one voucher specimen of each species was collected and preserved in 10% formalin (Victor and Meye 1994) for identification and laboratory work. Morphological features of each species were measured following Moyle and Senanayake (1984). Identification of the species was carried out following Day (1865), Jayaram (1981), and Talwar and Jhingran (1991). The recent classification of Nelson (1984) was followed.

**Results and Discussion:** A total of 38 species belonging to 21 genera, 12 families and 8 orders have been collected and identified during the study from the sanctuary. Common and vernacular names (Kan-Kannada, Mal-Malayalam, Tam-Tamil), diagnostic features, range of distribution and general status of the species are discussed.

Mudumalai sanctuary has the unique distinction of having a large number of rare and endemic fish species. Out of 38 species collected, 27 species belong to Cyprinidae. 36 species are native and two are introduced species. 39% of the total species are uncommon or rare and endemic. The sanctuary harbours four species, *Puntius mudumalaiensis*, *Danoi neilgheriensis*, *Puntius melanostigma* and *Mystus punctatus*, endemic to Nilgiri Biosphere Reserve. While *P. mudumalaiensis* is exclusive to MWS (Menon and Rema Devi 1992), the other three species were found elsewhere in the NBR. Only two individuals of *Tor khudree*, an endangered species, were collected during our study. All the specimens were preserved in 10% formalin and are deposited at the Sálím Ali Centre of Ornithology and Natural History (SACON).

## Description of the species

**Order:** Anguilliformes

**Family:** Anguillidae

### 1. *Anguilla bengalensis* (Gray)

**Salient features:** D. 250-300; P. 18; A. 218-248; C. 10-12.

**Common name:** Indian long-fin eel

**Vernacular name:** Kan - Karimenu; Mal - Vilangu, Mlanjil; Tam - Velangoo.

**Diagnosis:** Body elongate; mouth terminal; angle of mouth behind posterior margin of eye; dorsal fin inserted nearer anus than gill-opening; colour yellowish, mottled with dark brown.

**Locality and range:** Moyar near Kargudi; throughout India.

**Relative abundance:** Not common.

**Order:** Cypriniformes

**Family:** Cyprinidae

### 2. *Cirrhinus reba* (Hamilton)

**Salient features:** D. 1/8; P. 1/6; V. 1/9; A. 1/6; C. 8/18.

**Common name:** Reba carp.

**Vernacular name:** Kan - Bathili, Thari meenu, Arja; Mal - Reba; Tam - Arijan kendai, Kull arinjan, Poorali, Pillarinjan.

**Diagnosis:** Body elongate; depth more than head length; one pair of short rostral barbels; pectoral fin as long as head; caudal deeply forked; lateral line complete with 34-38 scales; lateral transverse 7/6; Colour silvery on sides; greyish back, anal and pelvic fins orange tipped.

**Locality and range:** Moyar; throughout India.

**Remarks:** It is a planktivorous fish and can be cultivated in ponds. Commonly available in the Cauvery river.

**Relative abundance:** Not common.

### 3. *Cyprinus carpio* Linnaeus

**Common name:** Common carp.

**Diagnosis:** Body stout; head triangular; mouth small and oblique; thick lips; 2 pairs of barbels; dorsal fin inserted midway between snout and base of caudal; dorsal spine serrated; scales large; lateral line with 30-40 scales; colour silvery to golden, fins yellowish to golden.

**Locality and range:** Moyar; throughout India.

**Remarks:** The common carp has three recognised varieties: *C. carpio* var. *communis* (scale carp), *C.c.* var. *nudus* (leather carp) and *C.c.* var. *specularis* (mirror carp). The mirror carp was brought from Sri Lanka in 1939 and stocked in the Ooty lake (Tamil Nadu). This fish is an omnivorous bottom dweller.

**Relative abundance:** Not common.

### 4. *Labeo bata* (Hamilton)

**Salient features:** D. 2-3/9-10; P. 1/16-17; V. 1/8; A. 3/5-6.

**Common name:** Bata.

**Vernacular name:** Tam - Kindameen, Sinakannan meen.

**Diagnosis:** Body elongate, snout slightly projecting, with pores; lower lip slightly fringed; 1 pair minute maxillary barbels; lateral line with 37-40 scales; predorsal scales 10-13; colour-golden yellow on back, silvery on sides, irregular black blotch present on 4th-6th lateral line scales, pelvic and anal fins dark with orange red tips.

**Locality and range:** Confluence of Moyar and Kakkan halla; Krishna, Cauvery and Godavari river systems.

**Remarks:** It is a minor carp, having a maximum length of 610 mm.

**Relative abundance:** Rare.

### 5. *Puntius bimaculatus* (Bleeker)

**Salient features:** D. 4/7-8; P. 1/14-15; V. 1/8; A. 3/5.

**Common name:** Two-spot barb.

**Diagnosis:** Elongate body; one pair of barbels; dorsal ray weak; lateral line complete with 24-25 scales; predorsal scales 8 to 10; back olive green, black spot at base of 3rd to 8th ray of dorsal fin; black spot at end of lateral line on 23rd and 24th scale.

**Locality and range:** Moyar; Kalakkad.

**Remarks:** Grows upto 60 mm.

**Relative abundance:** Rare.

#### 6. *Puntius bovanicus* (Day)

**Salient features:** D. 4/9-10; P. 1/18; V. 1/8; A. 3/6.

**Common name:** Bhavani barb.

**Vernacular name:** Tam - Bhavani kendai

**Diagnosis:** Body elongate; no bands or spots; four well developed barbels; dorsal ray osseous, strong and smooth; lateral line complete with 24-26 scales; greenish colour with a golden tinge, darkest along the back.

**Locality and range:** Moyar; Bhavani river, Cauvery river and its tributaries at the base of the Nilgiri hills, Tamil Nadu.

**Remarks:** A rare barb with restricted distribution.

**Relative abundance:** Rare.

#### 7. *Puntius carnaticus* (Jerdon)

**Salient features:** D. 4/8; P. 2/15-16; V. 1/8; A. 2/6; C.6/18.

**Common name:** Carnatic Carp.

**Vernacular name:** Kan - Gendai; Mal - Kavery kenta; Tam - Pulli kendai, Poaree candee, Saal kendai.

**Diagnosis:** Deep bodied; no bands or spots; four barbels; dorsal ray osseous, strong and smooth; lateral line curved, complete, with 28-31 scales; predorsal scales 10-12; dark olive green back, dull white on abdomen and sides; fins dusky, outer margin of dorsal fin black. 'V' shaped marking on the caudal.

**Locality and range:** Moyar; Krishna and Cauvery river system - Nilgiris, Wynaad and Canara.

**Remarks:** It grows to a fairly large size, upto 12 kg in weight.

**Relative abundance:** Common.

#### 8. *Puntius chola* (Hamilton)

**Salient features:** D. 3/7-8; P. 1/14; V. 1/8; A. 2/5

**Common name:** Chola barb, swamp barb, green barb.

**Vernacular name:** Kan - Dhoddakarse; Mal - Poovali kendai, koroon; Tam - Korron, Putti kendai, Macha kendai, Vannathi.

**Diagnosis:** Deep bodied; no bands; one pair of barbels; dorsal fin ossified, spine smooth; lateral line complete with 24 to 29 scales; black spot after gill opening and caudal base.

**Locality and range:** Mavan halla and Moyar; throughout India.

**Remarks:** Fairly common in coastal areas of Tamil Nadu and Kerala.

**Relative abundance:** Not common.

#### 9. *Puntius dorsalis* (Jerdon)

**Salient features:** D. 4/8; P. 1/13-14; V. 1/8; A. 3/5-6.

**Common name:** Long-snouted barb.

**Vernacular name:** Kan - Markakka; Tam - Kendai.

**Diagnosis:** Body elongate; one pair of barbels; last unbranched dorsal ray osseous, strong and smooth; lateral line complete with 22-28 scales; predorsal scales 8 to 10. Colour olive dorsally, silvery sides, fins orange. A black blotch on tail.

**Locality and range:** Mavin halla; Krishna and Cauvery river systems.

**Remarks:** Grows upto 150 mm.

**Relative abundance:** Rare.

#### 10. *Puntius filamentosus* (Valenciennes)

**Salient features:** D. 2/7; P. 1/14; V. 1/8; A. 1/5; C. 6/16.

**Common name:** Tiger barb, black spot barb.

**Vernacular name:** Mal - Kachi parval;

Tam - Chevalle, Machakendai.

**Diagnosis:** Elongate body; one pair rudimentary maxillary barbels; dorsal ray prolonged upto caudal base; third ray longest; lateral line complete with about 21 scales; black spot on caudal peduncle.

**Locality and range:** Sinkaara; Krishna and Cauvery drainages.

**Remarks:** It also breeds in ponds. Four black vertical stripes on a pink body in juveniles. As the fish matures, the stripes disappear and only one remains as a horizontal oval spot on the caudal peduncle.

**Relative abundance:** Not common.

11. *Puntius melanostigma* (Day)

**Salient features:** D. 2/8; P. 1/14; V. 1/8; A. 2/5.

**Common name:** Wynaad barb.

**Vernacular name:** Mal - Kudukunda; Tam - Macha kendai.

**Diagnosis:** Elongate body; no vertical colour bands; one pair of maxillary barbels; dorsal ray weak and osseous; lateral line complete with 23 to 26 scales; predorsal scales 8; silvery colour; deep black blotch on base of caudal fin.

**Locality and range:** Moyar and Bidar halla; Cauvery river system, Wynaad hills and Bhavani river.

**Remarks:** Grows upto 100 mm.

**Relative abundance:** Rare.

12. *Puntius mudumalaiensis*

Menon and Rema Devi

**Salient features:** D. 4/8; P. 13; V. 1/8, A. 3/5; C. 1/17.

**Diagnosis:** A small *Puntius* with proportionately big head with a deep body; one pair of maxillary barbels; weak and articulated dorsal spine; lateral line incomplete; 2 blotches, one on dorsal base and the other on caudal peduncle.

**Locality and range:** Mudumalai-Kakkan halla; Nilgiris.

**Remarks:** Attains a maximum length of 230 mm.

**Relative abundance:** Rare and endemic.

13. *Puntius sarana sarana* (Hamilton)

**Salient features:** D. 3/8; P. 1/15; V. 1/8; A. 3/5.

**Common name:** Olive barb.

**Vernacular name:** Kan - Gid-pakka; Mal - Kuruka; Tam - Pingella, Panjelai kendai, Pallu kendai.

**Diagnosis:** Body elongate; four barbels; dorsal ray osseous and serrated; lateral line complete with 30-33 scales; each scale has long black lines and dark border posteriorly.

**Locality and range:** Moyar; south of Krishna river.

**Remarks:** It is found in ponds, lakes and rivers. It grows to 600 mm length and breeds during the monsoon.

**Relative abundance:** Common.

14. *Puntius sarana subnasutus* (Valenciennes)

**Common name:** Peninsular Olive barb

**Diagnosis:** Body oblong; four barbels; dorsal ray osseous and fairly strong; lateral line complete with 28-31 scales; predorsal scales 10; colour silvery on back fading to white beneath; a dark band behind opercular and a black blotch on the 24th scale of the lateral line; fins orange.

**Locality and range:** Benne hole; Krishna and Cauvery river systems and south of it.

**Remarks:** Common in Kerala backwaters.

**Relative abundance:** Not common.

15. *Puntius ticto* (Hamilton)

**Salient features:** D. 2/7; P. 1/9-10; V. 1/8; A. 2/5; C. 6/16-18.

**Common name:** Ticto barb, Tic-tac-toe Barb, fire fin barb.

**Vernacular name:** Mal - Kadum kali; Tam - Palli kendai.

**Diagnosis:** Deep bodied; barbels absent; dorsal ray short, osseous and serrated; lateral

line complete or incomplete; a black blotch on 3rd, 4th or 5th lateral line scale and another between scales 16-20.

**Locality and range:** Moyar, Ombatta and Kakkan halla; widely distributed in India.

**Remarks:** A popular aquarium fish, preferred for its iridescence and red edging on the dorsal fin. The fish shows variable colouration, lateral line scales, etc.

**Relative abundance:** Rare.

16. *Puntius wynaadensis* (Day)

**Salient features:** D. 4/9; P. 1/16-17; V. 1/8; A. 3/5-6.

**Salient features:** Wynaad barb.

**Diagnosis:** Deep bodied, dorsal spine weak and articulated, two pairs of well developed barbels; eight rows of sensory pores below eye; cartilaginous pad on lower jaw; lateral line complete, curved with 28-29 scales; predorsal scales 10; mid-dorsal streak and faint line along the sides above lateral line.

**Locality and range:** Kakkan halla and Moyar; Wynaad and headwaters of the Cauvery river.

**Remarks:** Grows upto 250 mm.

**Relative abundance:** Rare.

17. *Tor khudree* (Sykes)

**Salient features:** D. 4/9; P. 1/14; V. 1/8; A. 2/7-8.

**Common name:** Deccan Mahseer, Yellow Mahseer.

**Vernacular name:** Kan - Bili meen; Tam - Biriga, Poomeen, Peruval.

**Diagnosis:** Body elongate; snout covered with indistinct tubercles; eyes visible from underside of head; four barbels; lower lip protruding; pectoral fins short; large scales; lateral line scales 25-27; colour silvery with yellow below lateral line, belly bluish, eyes red, fins bluish grey.

**Locality and range:** Moyar near Kargudi;

Deccan (Krishna and Godavari river systems of Peninsular India).

**Remarks:** It grows to 450 mm and about 22 kg in weight.

**Relative abundance:** Critically endangered.

**Subfamily:** Rasborinae

18. *Barilius bendelisis* (Hamilton)

**Salient features:** D. 2/7, P. 1/10, V. 1/8, A. 2/8, C. 6/19.

**Common name:** Hill trout.

**Vernacular name:** Mal - Pavakan; Tam - Vennathi kendai.

**Diagnosis:** Body shallow; jaws long; four short barbels; poorly developed tubercles on snout and lower jaw; dorsal fin inserted in advance of anal fin; lateral line scales 40-45; predorsal scales 18-20; colour greyish black, sides silvery, with 8-10 dark vertical bands.

**Locality and range:** Throughout the sanctuary; India.

**Remarks:** It grows to about 150 mm and is fairly common in the region.

**Relative abundance:** Very common.

19. *Barilius gatensis* (Valenciennes)

**Salient features:** D. 1/10; P. 1/10; V. 1/8; A. 2/11; C. 6/18.

**Common name:** Hill trout, river carp.

**Vernacular name:** Mal - Pavakan.

**Diagnosis:** Active stream fish with a deep body; two minute rostral barbels; dorsal fin inserted in advance of anal fin; tubercles on head well developed; lateral line with 40-41 scales; predorsal scales 15; colour silvery grey with 13-15 vertical bars.

**Locality and range:** Mavin halla; Western Ghats - Maharashtra, Karnataka, Tamil Nadu and Kerala.

**Remarks:** Grows to 150 mm.

**Relative abundance:** Rare.

20. *Danio aequipinnatus* (McClelland)

**Salient features:** D. 2/10; P. 1/9; V. 1/5; A. 2/13; C. 8/18.

**Common name:** Blue or Giant Danio.

**Vernacular name:** Tel - Vannathipodi; Tam - Selai parvai, Vananthipodi.

**Diagnosis:** Body elongate and compressed; pre-orbital spine present on the lachrymal bone; mouth directed upwards; four short barbels; lateral line complete with 35-37 scales; predorsal scales 15; colour brilliant blue with well developed lateral dark blue bands, on the sides of which are thinner golden bands, fins bright orange.

**Locality and range:** Throughout the Sanctuary; throughout India.

**Remarks:** It is widely distributed throughout India and is an attractive aquarium fish. It grows to 150 mm and prefers hill streams.

**Relative abundance:** Very common.

21. *Danio neilgherriensis* (Day)

**Salient features:** D. 1/11; P. 1/9; V. 1/6; A. 1/10; C. 6/18.

**Common name:** Peninsular Danio.

**Vernacular name:** Tam - Kowlei.

**Diagnosis:** Body elongate and compressed; mouth small and obliquely directed upwards; four short barbels; dorsal fin inserted in advance of anal fin; lateral line complete with 38 scales; predorsal scales 16-18; colour silvery with greenish back, a steel blue stripe along the sides.

**Locality and range:** Confluence of Moyar and Ombatta; Tamil Nadu (Nilgiri hills).

**Remarks:** It grows to about 100 mm.

**Relative abundance:** Rare.

22. *Esomus barbatus* (Jerdon)

**Salient features:** D. 2/6; P. 1/14; V. 1/8; A. 3/5

**Common name:** South Indian flying barb.

**Vernacular name:** Tam - Messai paravai

**Diagnosis:** Body elongate and strongly compressed; mouth small; four barbels,

maxillary barbels extended upto middle of pectoral fin; pectoral fins long but do not extend upto pelvic fins; lateral line complete with 30-32 scales; predorsal scales 17; colour silvery with an indistinct streak on the side.

**Locality and range:** Confluence Ombatta and Ombatta thodu; Karnataka and Tamil Nadu.

**Remarks:** It grows to 120 mm.

**Relative abundance:** Not common.

23. *Parluciosoma daniconius* (Hamilton)

**Salient features:** D. 3/13; P. 1/12-13; V. 1/8; A. 1/6; C. 8/18.

**Common name:** Blackline rasbora

**Vernacular name:** Kan - Neddean jubbu, Kolkane, Kolainjan kendai, Mal - Kannanjan; Tam - Jobidayee, Narangi

**Diagnosis:** Body oblong and compressed; lips simple; pectoral fins short; lateral line complete with 34 scales; colour silvery with dark back, a distinct dark band on the sides flanked with gold.

**Remarks:** Commonly found in almost all aquatic habitats, it grows to 100 mm.

**Locality and range:** Throughout Mudumalai; throughout India.

**Relative abundance:** Very common.

Subfamily Garrinae

24. *Garra gotyla stenorhynchus* (Jerdon)

**Salient features:** D. 3/8; P. 6/9; V. 2/7; A. 2/5; C. 6/17.

**Common name:** Stone sucker, Nilgiri garra.

**Vernacular name:** Mal - Kallangkari; Tam - Kal kaagan.

**Diagnosis:** Body elongate and subcylindrical; depth of body 5 or more times in standard length; snout with a proboscis; 4 barbels; lateral line scales 32-35; predorsal scales 8-10; colour greyish above and pale on the sides, a black spot on operculum.



**Locality and range:** Throughout the sanctuary; Western Ghats - Krishna and Cauvery river systems.

**Remarks:** Grows to 150 mm. An ideal example of morphological adaptation to stream habitat.

**Relative abundance:** Common.

25. *Garra mullya* (Sykes)

**Salient features:** D. 2/8; P. 2/10-11; V. 1/8; A. 1/5; C. 4/18.

**Common name:** Stone carp, Mullya garra.

**Vernacular name:** Kan - Pandi pakka; Mal - Kamau, Kallu nakki; Tam - Kallu koravai.

**Diagnosis:** Body depth four times in standard length; snout rounded and marked by a deep transverse groove; mouth small; four barbels; caudal fin emarginate; lateral line scales 32-34; predorsal scales 9-11; dorsal side dark, belly white, broad lateral band on the sides. A distinct red spot on operculum.

**Locality and range:** Moyar and Kakkan halla; India.

**Remarks:** Specimens from widely separated river systems show morphological variations in size of mental disc, shape, colouration, etc.

**Relative abundance:** Not common.

**Family:** Cobitidae

**Subfamily:** Cobitinae

26. *Lepidocephalus thermalis* (Valenciennes)

**Salient features:** D. 3/6; P. 1/7; V. 1/6; A. 3/5.

**Common name:** Malabar loach.

**Vernacular name:** Mal - Ayira; Tam - Assaree, Assari meen.

**Diagnosis:** Body elongate; mouth inferior; six barbels; dorsal fin inserted anterior to pelvic fin; caudal fin truncate; scales present on anterior side of pectoral fin base; colour greyish green

with 8 to 10 irregular blotches on sides; dorsal and anal fins with rows of spots.

**Locality and range:** Kakkan halla and Mavin halla; Maharashtra, Karnataka and Kerala.

**Remarks:** Grows upto 80 mm. This species exhibits wide variation in colour pattern in different river systems.

**Relative abundance:** Not common.

**Family:** Balitoridae

**Subfamily:** Noemacheilinae

27. *Noemacheilus denisoni denisoni* Day

**Salient features:** D. 3/8; P. 1/10; V. 1/6; A. 3/5.

**Diagnosis:** Eight branched dorsal fin rays; pelvic touching the anal opening; caudal deeply emarginate with rounded lobes; lateral line incomplete, ending in front of dorsal fin; body with varying number of brown bands, more distinct behind dorsal fin; predorsal distance 22.5-55.5% of SL.

**Locality and range:** Kakkan halla and Mavin halla; Peninsular India, Bastar (M.P.), Pamba and the Kollur drainages of Kerala and Karnataka respectively.

**Remarks:** Grows to a maximum length of 50 mm. Commonly caught by tribals using traditional methods.

**Relative abundance:** Common.

28. *Noemacheilus nilgiriensis* Menon

**Salient features:** D. 3/8; P. 1/9-10; V. 1/6; A. 2/6.

**Diagnosis:** Eight branched dorsal fin rays; pelvic separated from anal opening by a considerable distance; lateral line incomplete, terminating above tip of pectoral fin; caudal emarginate; body with 11-12 brownish vertical bands.

**Locality and range:** Moyar; Pykara dam, Nilgiri district, Tamil Nadu.

**Remarks:** Maximum length 51 mm.

**Relative abundance:** Rare. Endemic to Nilgiris.

**Order:** Siluriformes

**Family:** Bagridae

29. *Mystus cavasius* (Hamilton)

**Salient features:** D. 1/7; P. 1/8; V. 1/5; A. 4/9.

**Common name:** Gangetic mystus, Dwarf catfish.

**Vernacular name:** Kan - Naii kirle; Tam - Solai kelunthi.

**Diagnosis:** Body elongate and compressed; head conical; occipital process extends to dorsal fin base; branchiostegal rays six; eight barbels, maxillary barbels extend beyond caudal fin base; dorsal spine weak; colour greyish with a longitudinal stripe.

**Locality and range:** Throughout the Sanctuary; India.

**Remarks:** It grows to about 500 mm.

**Relative abundance:** Not common.

30. *Mystus punctatus* (Jerdon)

**Salient features:** D. 1/7; P. 1/8; V. 1/5; A. 4/8.

**Common name:** Nilgiri Mystus.

**Vernacular name:** Tam - Sholang kellete

**Diagnosis:** Body elongate and compressed; head depressed; occipital process not extending to dorsal fin base; eight barbels, maxillary barbels extend to end of pelvic fins; dorsal spine strong and serrated on upper portion; branchiostegal rays 11; colour greyish dorsally with yellowish sides, 10 black spots along lateral line.

**Locality and range:** Ombatta swamp; Western Ghats - Nilgiri hills.

**Remarks:** It grows to about 450 mm.

**Relative abundance:** Rare.

**Family:** Siluridae

31. *Ombak bimaculatus* (Bloch)

**Salient features:** D. 4; P. 1/13-14; V. 1/8; A. 3/58-59.

**Common name:** Indian butter-catfish.

**Vernacular name:** Mal - Manjivhala; Kan - Godla; Tam - Silaivhalai; Chottavala.

**Diagnosis:** Body elongate and strongly compressed; mouth large and oblique; four barbels, maxillary barbels extend to anal fin; anal fin long with 57-58 branched rays; colour silvery with a large shoulder spot on the lateral line, a small blotch on the caudal peduncle.

**Locality and range:** Ombatta swamp; India.

**Remarks:** Grows to about 450 mm; found in rivers, tanks and ponds.

**Relative abundance:** Common in Ombatta swamp.

**Family:** Sisoridae

32. *Clarias dayi* Hora

**Salient features:** D. 68-69; P. 1/11; V. 1/5; A. 55-59.

**Common name:** Magur, Air-breathing catfish.

**Vernacular name:** Mal - Muzhi; Tam - Masarai; Kan - Hali meenu.

**Diagnosis:** Body elongate, head depressed; mouth terminal; eight barbels, short, not extending beyond eyes; nasal barbels shorter than half head length, dorsal fin inserted behind pectoral fin tip; pectoral spine strong and serrated on its outer edge only; colour dark on back, lighter on sides.

**Locality and range:** Ombatta swamp; Wynaad hills, Kerala.

**Remarks:** Day collected a single specimen measuring 175 mm.

**Relative abundance:** Rare.

**Order:** Cyprinodontoformes

**Family:** Poeciliidae

33. *Gambusia affinis* (Baird and Girard)

**Salient features:** D. 1/8; P. 14; V. 6; A. 9-10.

**Common name:** Mosquito fish.

**Diagnosis:** Body elongate, depth 3.5 to 4 times the standard length; eyes large; in males the dorsal fin is inserted in middle of body while in females it is midway between front margin of eye and tip of caudal fin; gonopodium as long as head length; colour greyish with isolated black spots on body.

**Locality and range:** Ombatta; India.

**Remarks:** It was introduced into Indian waters in 1928 from Italy under an antimalarial programme. It grows to about 60 mm, is a very hardy fish and can survive in diverse habitats.

**Relative abundance:** Not common.

**Order:** Channiformes

**Family:** Channidae

#### 34. *Channa marulius* (Hamilton)

**Salient features:** D. 50-55; P. 17-18; V. 6; A. 30-36.

**Common name:** Giant snakehead, murrel.

**Vernacular name:** Kan - Aviiuu; Mal - Curuva, Cherumeen; Tam - Puvoral, Aviri, Coaree veral.

**Diagnosis:** Body elongate; mouth large; scales of moderate size; cluster of head scales between the orbits, frontal head scales occupying centre of cluster; 10 rows of scales between preopercular angle and posterior border of orbit; lateral line scales 60-70; predorsal scales 16; colour greyish green above lateral line, blotches of pale yellow below lateral line; distinct white spots scattered on the body; dorsal and anal fins also with white spots; caudal fin with white spots arranged into vertical bands; distinct ocellus at base of caudal fin, in the upper portion.

**Locality and range:** Ombatta swamp, Mavan halla and Kakkan halla; throughout India.

**Remarks:** A good sport fish, growing to 1220 mm. It prefers large lakes and rivers with sandy to rocky bottom. It is a highly aggressive carnivore in nature.

**Relative abundance:** Rare.

#### 35. *Channa orientalis* Bloch and Schneider

**Salient features:** D. 34-37; P. 14-15; V. 6; A. 22-23.

**Common name:** Brown snakehead.

**Vernacular name:** Kan - Mottu, Mohkorava; Mal - Karayu, Bral, Vatton; Tam - Para koravai, Manian koravai.

**Diagnosis:** Body elongate; mouth large; pectoral fins extend to anal fin; dorsal fin rays 32-37; length of pelvic fin less than 50% of pectoral fin length; scales on longitudinal series 40 to 50; colour dorsal side greenish, ventral side pale with bluish tinge. Pectoral fins with a series of vertical bands.

**Locality and range:** Mavan halla and Kakkan halla, Ombatta swamp; India.

**Remarks:** Fairly common species in the Western Ghats. It is of some fishery value in Maharashtra.

**Relative abundance:** Not common.

**Order:** Perciformes

**Family:** Cichlidae

#### 36. *Oerochromis mossambica* (Peters)

**Salient features:** D. 16/12; P. 15; V. 1/5; A. 3/11.

**Common name:** Tilapia.

**Vernacular name:** Kan - Tilapia; Mal - Tilapi; Tam - Thillappi, Jilabimeen.

**Diagnosis:** Body elongate and compressed; mouth large and terminal; dorsal fin inserted above base of pectoral fin with 15-16 spines; scales cycloid; scales in lateral series 30-32; colour greyish with 3-4 dark blotches on side; dorsal fin with red margin, pectoral fin translucent.

**Locality and range:** Moyar near Theppakadu; India.

**Remarks:** Introduced in 1952 and has now spread at an alarming rate to almost all the major river systems.

**Relative abundance:** Very common.

**Family:** Gobidae

37. *Glossogobius giuris* (Hamilton)

**Salient features:** D. 4+1/9; P. 1/20;  
A. 1/8.

**Common name:** Tank gobi.

**Vernacular name:** Tam - Vuluvai.

**Diagnosis:** Body elongate, anteriorly cylindrical and compressed; head depressed; mouth oblique; tongue bilobed; gill openings continued far forward; colour yellowish brown without longitudinal lines, iris without process in eye.

**Locality and range:** Ombatta swamp; India.

**Remarks:** It grows to about 250 mm and is fairly common in the rivers of the Western Ghats. It prefers deeper waters.

**Relative abundance:** Rare.

**Order:** Mastacembeliformes

**Family:** Mastacembelidae

38. *Mastacembelus armatus* (Lacepede)

**Salient features:** D. 36-38/88; P. 26;  
A. 3/85.

**Common name:** Tyre-track spiny eel.

**Vernacular name:** Mal - Mookkan arakan, Aaron; Tam - Kul aral.

**Diagnosis:** Body eel-like and slender; dorsal fin with 32-40 spines and 64-92 soft rays; dorsal and anal fins broadly joined to caudal fin; colour brownish with wavy lines forming a network, dorsal and anal fins banded.

**Locality and range:** Moyar; India.

**Remarks:** It grows to about 500 mm and is one of the largest spiny eels in India.

**Relative abundance:** Rare.

CONSERVATION MEASURES

Various human activities such as deforestation, construction of dams, discharging

industrial effluents into rivers, dynamiting, over fishing and introduction of exotic fishes are responsible for loss of fish diversity of the region (Menon 1992). Considering the major threat to fishes in MWS is mainly poisoning and occasional dynamiting along the border area, the following conservation measures are suggested:

1. Mass poisoning of fishes using different plant parts should be banned inside the sanctuary.
2. Fishing should be restricted to angling.
3. Establishment of fish sanctuaries, especially near large natural pools along the course of the stream/river. Fishing activities should be restricted in these habitats.
4. Fishing during the breeding season (March-July and October-December) should be avoided.
5. Riparian vegetation can be established to provide good food resources for fish.
6. Environmental awareness programmes regarding importance of conserving fish and fish habitats should be initiated in the villages inside the Sanctuary. Poster campaigns on rare and endemic species will be very useful.

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